TUBERCULOSIS IN THE SUDAN, WITH NOTES ON A CASE OF BREAST TUBERCULOSIS IN A SUDANESE

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PLATE XII

It would appear from the number of papers recently published dealing with the subject of 'Tuberculosis in the Tropics' that interest in this disease has been awakened, and in view of its importance, the writer feels little apology is needed for offering some general observations on 'Tuberculosis in the Sudan.'

Unfortunately, such observations can in no sense be considered complete, as they are based on a limited amount of clinical and pathological material obtained during the past fourteen years from almost every district of the Sudan. Limited though this material has been, it is in the main representative of a disease which, happily, has not assumed the proportions prevailing in Western countries or even in some of the towns of the Far East.

The reason for this is not far to seek. At the present time the Sudan lacks the thickly populated centres of other countries in the West and East. Vast tracts of desert waste and swamp still await to be linked up by means of railways, and although inter-tribal trade and communications have been encouraged under British administration, there still exists in certain parts a conservatism fostered by racial and religious differences, which will take years to break down.

Once these obstacles are removed, the seeds of tubercle will assuredly grow and be disseminated on what can only be considered a virgin soil.

Any opinion offered as to how and when the disease was first introduced into the Sudan can merely be hypothetical.

In the days of Mahdism and up to the time of the British occupation, the country certainly enjoyed a comparative seclusion from the tide of civilization. On the Northern frontier, little intercommunication occurred with Egypt. The perils attendant on the long desert wastes of this region acted as a deterrent to intimate relations between the two countries, and it is safe to infer that little encouragement was offered to the pagan tribes of the South and West, while on the Eastern Abyssinian frontier, the racial and religious differences of the two countries were sufficient reasons for keeping them aloof.

It is, however, to the earlier history of the country that one must turn for information regarding the introduction of tuberculosis; this history, as will be seen from archaeological records, is intimately connected with the ancient history of Egypt.

As far back as 2600 B.C. the Northern Sudan was invaded by the Egyptians, and from 2000-1000 B.C. this portion of the Sudan appears to have been occupied by them and regular colonies established as far south as Kerma in the Dongola Province.

That tuberculosis was existent among the Egyptians during these periods was established by the late Sir Armand Ruffer (1921), whose work on the 'Palaeopathology of Egypt' is well known. In an admirable collection of his studies on the subject, edited by Prof. Moodie, of Illinois University, there are plates illustrating Pott's disease in figures discovered in the tombs of Beni Hassan, 2000 B.C. Two other plates also depict graphically Pott's disease, and a large psoas abscess in a mummy of a priest of Ammon of the XXIst Dynasty, 1000 B.C.

Derry's (1907-08) investigations recorded in the 'Archaeological Survey of Nubia,' apart from representing the first record of tuberculosis in the Sudan, afford circumstantial proof of the introduction of the disease from Egypt into Lower Nubia, and it appears reasonable, therefore, to infer that tuberculosis obtained a footing in the Sudan synchronously with the tide of settlers from Egypt, but did not spread throughout the country for reasons already mentioned.

At the present time there is little doubt that the disease is practically confined to the larger towns of the Northern Sudan.

It is here that the factors concerned with stress, and resultant to a great extent on civilization, play no small part. Overcrowding,

intestinal parasitism, malaria, venereal disease, alcoholism and the 'hasheesh habit' undoubtedly predispose to infection by lowering the resistance of individuals peculiarly susceptible to the virus of tubercle.

Amongst the hardy, simple-living nomadic tribes of the desert and the comparatively secluded tribes of the South, the disease is practically unknown; with increasing facilities for inter-communication, however, such a state of things is unhappily not likely to continue.

For obvious reasons, more especially when one is dealing with a Mahommedan population, it is impossible to obtain statistics regarding the incidence of, or death rate from, tuberculosis. Racial and religious prejudices often interfere with the calling in of qualified medical aid, and post-mortems are rarely obtained except in cases presenting a medico-legal aspect. Consequently one is compelled to admit that figures obtained from hospitals and dispensaries do not represent the true incidence of tuberculosis in the country, and the writer is of the opinion that such incidence is higher than is suspected. Unfortunately von Pirquet's test has not been carried out on a sufficiently large scale to permit of any deductions being made.

The tribes of the Sudan are very susceptible to such respiratory diseases as bronchitis, broncho-pneumonia and pneumonia, and their predisposition to tuberculosis was referred to many years ago by Balfour (1904). The Sudanese or 'black' appears peculiarly susceptible, and it is stated that the Hadendowa, a black tribe inhabiting the hills of the Red Sea, shares this susceptibility. Other observers, notably Bushnell (1920) and Cummins (1920), have called attention to the susceptibility of coloured races to tuberculosis.

Moreau (1919) and Roubier (1920) have pointed out the difficulties in detecting the disease among black troops even when the patients are greatly infected, and they prove the value of radiological examination in such cases.

The same difficulties are experienced in the Sudan, especially as regards pulmonary tuberculosis, and it may not be amiss to mention here that the disease is at times simulated by bronchial spirochaetosis and a bronchitis of streptococcal origin.

The predisposing causes to tuberculosis in the Sudan have already been referred to, and there is no doubt that overcrowding

and the filthy habit of expectoration are the determining factors concerned with the spread of the disease, more especially in the cold winter months when overcrowding to the exclusion of light and air favour the possibilities of 'massed infection.' Scott's (1921) observations equally emphasize the rôle played by overcrowding and expectoration as causative factors in tuberculosis among the Chinese in Hong Kong.

The view that infected milk is a cause of tuberculosis in the Sudan may readily be dismissed; it is true that goats' milk, cows' milk, and to a less extent camels' milk, represent an important feature in the dietary of the natives of the country; nevertheless, tubercular disease of these animals is unknown. Many years ago the writer (1910) recorded a case in which acid-fast bacilli were found in lesions of the lung of a camel simulating miliary tuberculosis, but it should be stated that the possibility of these lesions being caused by an organism of the streptothrix or *nocardia* group could not be excluded.

From the evidence obtained it would appear that inhalation is the common method of infection, such infection arising from dust-infected particles. Once tuberculosis is established in the lung, dust appears to be an irritating factor favouring the progress of the disease; incidentally it may be mentioned here that the practice of recommending cases of early tuberculosis to a country such as the Sudan is one to be deprecated inasmuch as they invariably become worse.

With regard to sex and age, the disease appears to be more prevalent among adult males, but allowance should be made for the fact that racial customs, more especially in some parts of the Sudan, do not encourage the female population to seek medical advice; however, having due regard to this, it would appear that the disease is more prevalent among the itinerant male population, a fact which is not in accordance with Lankester's (1920) observations in India. The children of the Sudanese appear to be rarely affected.

Of the varieties of tubercular disease in the Sudan, adenitis is perhaps the commonest; with lung tuberculosis, and a pleurisy of tubercular origin next in frequency; general miliary tuberculosis also occurs probably more commonly than is suspected, presenting with its pyrexia, cachexia, and splenomegaly, a clinical picture often

difficult of diagnosis and readily confused with other diseases. Pott's disease is exceedingly rare, and tubercular meningitis more so. It is doubtful whether skin tuberculosis exists. Cases labelled as such have, on bacteriological examination, proved to be early tubercular leprosy.

A few cases of joint tuberculosis have been observed by the writer, but are uncommon. Intestinal tuberculosis occurring as a primary affection of the intestines is exceedingly rare, as would be expected in a country where animal tuberculosis is non-existent.

Recently a case of breast tuberculosis came under the writer's observations, and as the disease is of sufficient rarity even in Western countries, a few detailed notes regarding this case are appended.

The patient was a Sudanese woman, about 40 years of age, hailing from the remote hilly districts of Kordofan, where she had spent the greater part of her life. She was married, and had a grown-up daughter who was in good health. According to her statement, her illness commenced some sixteen months ago with a painful swelling of the breast, which was not attributed to any injury received. The symptoms lasted for a period of twelve months and then subsided; however, about three months ago, she had recurring attacks of pain, and decided to come to Khartoum for treatment.

On admission to hospital her general condition was good, and during the few days prior to operation she showed a slight rise of temperature in the evenings.

On examination of the affected left breast, there was apparent a marked retraction of the nipple (Plate XII, fig. 1), but no evidence of ulceration or scar formation. On palpation, a nodular condition of the breast was detected. The nodules appeared to be located in the breast substance, were firm in consistency, and freely movable over the subjacent muscle tissue. The axillary lymphatic glands on the left side showed no appreciable enlargement, and were painless on palpation. The right breast appeared to be perfectly healthy.

Apart from the breast pain, the patient complained of no other symptoms. Examination of the lungs, heart and abdominal viscera revealed no abnormalities, nor were any enlargements of the cervical, subclavicular, mesenteric or groin glands detected. A total excision of the left breast was carried out, and some enlarged lymphatic nodes encountered during the operation were cleared away.

On sectioning the breast, numerous greyish-white, irregular-shaped nodules of various sizes were found scattered throughout the breast tissue (Plate XII, figs. 2 and 3). At the base of the nipple many of these nodules had coalesced and appeared to be fibrous. The majority of the nodules were firm in consistency; some, on the other hand, had broken down to form soft caseating masses, which could be readily shelled out of a capsule composed of dense fibrous tissue.

Subsequent histological examination of some of these nodules revealed their lymphatic structure.

The gross pathological appearances of the breast suggested tuberculosis in which fibrosis was a marked feature.

Film preparations of the broken down connecting débris were stained for the purpose of demonstrating tubercle bacilli, but with negative results.

Portions of the nodules with adjacent breast tissue were excised, fixed, embedded and sectioned for histological examination. Sections showed almost a complete absence of normal breast tissue. Necrotic foci of various sizes composed of granular amorphous material in which only a few nucleated cellular elements could be seen were scattered throughout the section. The larger foci, representing advanced caseous degeneration, were sharply demarcated by a zone of dense fibrous tissue. The smaller foci showed a pericellular reaction composed chiefly of lymphocytes and connective tissue cells, while scattered irregularly throughout the tissue were giant cells of Langerhams, containing six or more nuclei (Plate XII, fig. 4).

The blood vessels showed a periarteritis and also some thickening of the tunica media.

Sections of the lymphatic nodules showed well marked caseation with separative fibrotic changes and typical giant cell systems. The vessels here also showed a periarteritis and mesarteritis. Sections of the nodules were also stained by special methods to demonstrate tubercle bacilli, but with negative results.

REMARKS

There is little or no doubt that the case represented one of tuberculosis of the breast in which reparative changes of a fibrotic nature were a feature. Such changes probably accounted for tubercle

bacilli not being found in the sections and film preparations, and were also responsible for the marked retraction of the nipple.

It is to be regretted that no inoculation experiments were carried out, but in view of the reparative changes noted it is doubtful whether they would have led to a successful issue.

In all probability, the breast was secondarily infected via the lymphatics, although no primary focus of infection could be detected.

In view of its rarity, even in Western countries, the case appears worthy of record, and no similar case appears to have been previously reported from the Sudan.

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EXPLANATION OF PLATE XII

Fig. 1. Anterior view of the affected breast showing in the centre the marked retraction of the nipple.

Fig. 2. Section of the same breast showing the tubercular nodules demarcated by fibrous tissue.

Fig. 3. Showing a large caseating lymphatic node at the breast margin.

Fig. 4. Microphotograph of a section showing a single tubercle. In the centre is a giant cell sending protoplasmic processes into the surrounding epithelioid cells. The marginal portion of the tubercle shows the lymphoid cell infiltration. × 170.